Deciphering Interplay between Artificial Intelligence and Criminal Justice System in India: An Exploratory Study

PhD Synopsis

Scholar	**Taqwa Yousuf**
Enrolment Number	21154CUKmr001
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Supervisor	**Prof. Farooq Ahmad Mir** Department of Law Central University of Kashmir
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Introduction and Background

Artificial intelligence (AI) has long been a dream of civilization, appearing in works like Homer's Iliad, science fiction films from the 20th century, and Da Vinci's humanoid robot.[1] We now live in a time when artificial intelligence (AI) is a reality, and it is having very real and profound effects on our daily lives. Although the idea of AI started out as a fantasy, and occasionally as a dystopian future, as in Steven Spielberg's film Minority Report, which portrays a concerning use of cutting-edge technology in law enforcement. AI is changing how we live in a variety of ways, including phones, transportation, finances, and health care. Today, there is a rapidly growing consensus that artificial intelligence can revolutionize human existence across spheres in an unprecedented manner, even greater than the rise of machines in the Industrial Age.[2] While there are disparities in how different people understand and define the term *artificial intelligence* (AI), there are some agreed features that such tools and technologies must manifest. Given the human ability for thought, judgment and intention, AI reacts to stimulation in a way that is fundamentally similar to how conventional humans react.

The technology has evolved from obeying (executing) pre-designed and pre-configured codes, into a more sophisticated end product, imbued with human-like cognition. It now works not only automatically but autonomously as well. The robotic technology is now replacing humans by machines which work efficiently without any hazard to which human beings are prone. The potential of AI is endless and it is still in its evolutionary phases. It is unfolding its potential to newer areas of human activity. This is what gives it real potential to transform justice systems worldwide.[3] The introduction of AI technology in the criminal justice systems may have a number of effects on both justice professionals and the citizens who will be impacted by the process. Examples of these implications include how data is used, how privacy is protected, how systems are accountable and responsible, and how reliable they are.

History and Definition of Artificial Intelligence

Artificial Intelligence and machine learning were thought of long ago and are not new in the race, going back to the classical age, when machine and mechanical men were well considered. Talos, under Greek mythology, was a giant animated bronze warrior who was programmed to guard the Island of Crete.[4] In 1950, Alan Turing publishes his paper on creating thinking machines. He creates a Turing Test to determine whether or not a computer

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[1] Asma Idder, "Artificial intelligence in criminal justice: invasion or revolution?" *available at* https://www.ibanet.org/dec-21-ai-criminal-justice (last visited on 16-09-2022 at 10:09 PM).
[2] Vidhi Centre for Legal Policy and TCG-Crest, "Artificial Intelligence for the Indian Justice System A Strategy Paper", *available at* https://vidhilegalpolicy.in/research/responsible-ai-for-the-indian-justice-system-a-strategy-paper/ (last visited on 18-09-2022 at 6:53 AM).
[3] *Ibid.*
[4] Alisha, *Use of Artificial Intelligence in Criminal Justice System 1*,(BlueRose Publishers, 2021).

can think intelligently like a human being.[5] It was followed by an important year in the invention of Artificial Intelligence - 1956 when John McCarthy, who has been credited as the father of Artificial Intelligence (AI) presents his definition of AI at the Dartmouth Conference, as "the science and engineering of making intelligent machines".[6]

Scope of Study

The increasing capacities of artificial intelligence and its seeming competence at tasks formerly restricted to the human realm raise significant questions for the impact this technology may have on crime and criminal justice. AI technology could affect not only how crimes are committed, but also how law enforcement operates and how the criminal justice system functions. Of course, these drastic changes are not restricted to the administration of justice, as all sectors of human activity will be disrupted by AI. Criminal justice needed to be equally prepared and equipped to use technology like AI to improve crime prevention and control due to concerns about the disparities between offenders and law enforcement as the offenders are indulging in hi-tech crimes.[7]

In order to help with investigations and enable criminal justice professionals to better protect public safety, artificial intelligence has the potential to become a permanent component of our criminal justice ecosystem. Pattern recognition is crucial from the perspective of criminal justice. Humans are adept at identifying patterns, and through practice, we develop the ability to distinguish between many objects, individuals, complicated human emotions, facts, and circumstances on a regular basis. Artificial intelligence (AI) aims to imitate this human capability in computer hardware and software. Self-learning algorithms, for instance, use data sets to comprehend how to recognize individuals from their images, carry out complex computational and robotics tasks, comprehend online shopping habits and patterns, identify medical conditions from challenging radiological scans, and forecast stock market movements.[8]

The scope of AI in criminal justice system is varied and evolutionary. It may not be possible to cover all the aspects which may be unwieldy. The focus will remain mainly on three areas only *viz,* AI as a legal personality; AI for crime detection and AI for crime prevention. Artificial intelligence interface is bound to raise a host of legal issues that have to be addressed some of which are precisely presented hereunder:

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[5] *Ibid.*

[6] Christopher Rigano, "Using Artificial Intelligence to Address Criminal Justice Needs," *NIJ Journal 280, January 2019*, *available at* https:// www.nij.gov/journals/280/Pages/using-artificial-intelligence-to-address-criminal-justice-needs.aspx.

[7] Korean Institute of Criminology, "Artificial Intelligence in the Context of Crime and Criminal Justice A Report for the Korean Institute of Criminology" (December, 2018)., *available at https://www.academia.edu/40999602/Artificial_Intelligence_in_the_Context_of_Crime_and_Criminal_Justice*. (last visited on 22-09-2022 at 11:14 AM).

[8] *Supra* note 6.

1. AI as a legal personality

The main question to ask when examining the legal and regulatory implications of artificial intelligence adoption is whether the current legal framework is adequate to address potential legal problems or whether new legislation is required to govern these technologies. Such as who will be held accountable for any criminal liability arising from the actions of AI. A robot or artificial intelligence program cannot currently be held liable or accountable if a third party is harmed as a result of any act or omission on the part of the program under the current legal system. For instance, let us consider a situation where a self-driven car controlled via an artificial intelligence programgets into an accident. In November, 2021, two men were killed in driverless Tesla car crash. How will the liability be apportioned in such a scenario?[9]

Personhood of an entity is an incredibly essential legal aspect in assigning rights and liabilities. Personhood can be either natural or legal and whatever comes in between are tools, instruments, agents etc. Attribution of personhood is important from the point of view that it would help identify as to who would ultimately be bearing the consequences of an act or omission. However, this is a complex scenario and involves a plethora of issues but the two most important questions that crop up in this regard and need tobe answered are? Firstly, is it possible to confer legal personality on AI? And secondly, in what way can the legal personality be conferred on AI? Thirdly, what can be the limit of liability of AI?

2. AI Forensics for Crime Detection

Crime detection is the act of attempting to ascertain whether or not certain crimes are being or have been committed.

1) DNA Analysis

A scientific and evidence-processing perspective on AI can help the legal sector. This is especially true in the case of forensic DNA testing, which during the past few decades has had an extraordinary effect on the criminal justice system.

When committing a crime, contact with persons or items can convey biological material like blood, saliva, semen, and skin cells. The sensitivity of DNA analysis has increased along with DNA technology, enabling forensic professionals to find and use DNA evidence that was previously inoperable due to low levels, degradation, or other factors. For instance, laboratories are increasingly receiving decades-old DNA evidence from serious crimes like sexual assaults and cold instances of homicide for examination. Smaller amounts of DNA can be detected due to greater sensitivity, which makes it possible to detect DNA from many contributors even at very low levels. For crime laboratories, these and other innovations are creating new difficulties.

[9] Pramit Bhattacharya, "Core Legal Issues With Artificial Intelligence In India" *Fox Mandal Solicitors and Advocates*, *available at https://www.foxmandal.in/core-legal-issues-with-artificial-intelligence-in-india/* (last visited on 27-02-2023 at 8:10 AM).

For instance, it may be possible to detect DNA from multiple offenders or from someone who was not involved in the crime at all using highly sensitive methods on items of evidence, raising the issue of DNA mixture interpretation and the need to separate and identify (or "deconvolute") individual profiles in order to produce crucial investigative leads for law enforcement.[10]

AI has the capacity to solve this problem. More advanced artificial intelligence (AI) algorithms are being created in an effort to extract DNA profiles and determine if a DNA sample was accidentally transferred or came straight from a person who was at the crime scene. But the problem here is that currently it is impossible to ascertain how this AI reaches its conclusions and thus, there can be a violationof a fundamental tenet of law that evidence must be open to scrutiny. As a result, the fundamental questions which arise are Does AI-driven DNA Analysis also qualify for admissible evidence on the analogy of DNA which is an admissible evidence? Can AI-driven DNA analysis be considered as conclusive proof of the fact established through it?

2) Gunshot Detection

It is not uncommon for witnesses or patrolling police officers to hear "shots fired!" however, pinpointing the exact spot of the gunfire takes valuable time when each second matters. Gunshot detection software seeks to detect the occurrence of gunfire and detect the precise location of the gunshot. Acoustic gunshot detection systems typically use a set of microphones distributed over large populated areas that detect and isolate the staccato sounds of gunfire, which can be then confirmed by humans who may notify law enforcement where the gunshot went off. When police used Shot Spotter to apprehend a murderer in 2017 in Fresno, California, it had a significant impact. Authorities were able to track the murderer's whereabouts and apprehend him in 4 minutes, 13 seconds, thanks to technology.[11] Does this mean that the provisions dealing with the investigation of any crime can be dispensed with or these provisions can be supplemented by the Artificial Intelligence? Wherethere is a lapse in following mandatory investigating procedure, is it possible to supplement itby AI and plug the loopholes which may otherwise result in the acquittal on mere technicalgrounds?

3) Digital Forensics

Finding and analyzing electronic data is the process of digital forensics. By gathering, identifying, and validating the digital data, the process aims to preserve any evidence in its most authentic form while conducting a structured investigation to retrace historical

[10] Nipuni Wickramarathna and E.A.T.A Edirisuriya, " Artificial Intelligence in the Criminal Justice System: A Literature Review and A Survey" *available at:* https://www.researchgate.net/publication/358635259_Artificial_Intelligence_in_the_Criminal_Justice_System_A_Literature_Review_and_a_Survey_N_A_Wickramarathna_I_and_EATA_Edirisuriya (last visited on 22-09-2022 at 08:45 AM).

[11] Scott Smith, Gunfire Sensors Credited with Quick Arrest in Fresno Rampage" *AP News, available at* https://apnews.com/article/us-news-ap-top-news-fresno-arrests-ca-state-wire-977b4025bc334e8ab50d24486cb9fa03 (last visited on 27-01-2023 at 8: 30 AM).

events.[12] The context is most often for the usage of data in a court of law. The criminal justice and law enforcement sectors use video and image analysis to gather data on individuals, objects, and actions to aid in criminal investigations. However, video and image analysis is a very labour-intensive process that calls for a sizable investment in subject-matter experts. Due to the enormous amount of information, the quick pace of changing technologies like smartphones and operating systems, and the dearth of specialized personnel with the knowledge to process such information, video and image analysis is also vulnerable to human error. [13]

AI-based technologies give us the ability to correct such human errors and perform expert-level tasks. For facial recognition and pattern analysis, conventional software algorithms are restricted to predetermined features such as eye color, eye shape, and distance between the eyes. Beyond what humans may think of, AI video and image algorithms not only learn complex tasks but also create and establish their own independent complex facial recognition features/parameters to complete these tasks. These algorithms may be used to match faces, recognize weapons and other objects, and recognize complex events like accidents and crimes (whether they are occurring now or later).[14]The most important point is will courts be prepared to accept these developments orwe have to bring necessary changes in the criminal justice system to accommodate these technological developments?

3. AI for Crime Prevention

1) Predictive Policing

Predictive policing is an application/tool that is supported by artificial intelligence technology. Investigation teams and law enforcement organizations around the world are currently using these tools to prevent crimes from happening. These programs analyze the data from the available crime records using sets of data quantities that have been processed through analytical methods. The aim is to identify the likely targets of threats to mitigate possible risks and to forecast crimes and locations which are prone to them through such data analysis. Thus, in order to achieve the objective, these tools process the large sets of policedata including historical crime data collected with the aim to flag the prospective hotbeds of crime.[15]

Once the hotbeds or likely miscreants (individuals or groups) are identified that can potentially commit a crime, the flagging is done followed by deployment of law enforcement

[12] How We;,ll Do You Know Digital Forensics, *available at https://www.eccouncil.org/what-is-digital-forensics/* (last visited on 22-09-2022 at 09:21 AM).
[13] See Toward Mass Video Data Analysis: Interactive and Immersive 4D Scene Reconstruction, *available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7570841/ (*last visited on 22-09-2022 at 09:17 AM).
[14] *Supra* note 10.
[15] Sahajveer Baweja, "Predictive Policing: A Criminal Justice Tool That Threatens Human Rights", *Centre for Criminal Law Studies, The Criminal Law Blog, National Law University, Jodhpur, available at https://criminallawstudiesnluj.wordpress.com/2022/09/14/predictive-policing-a-criminal-justice-tool-that-threatens-human-rights/*

agencies to prevent occurrence of crime. Hence, the whole purpose of these tools used in law enforcement mechanism is to tend the focus on preventing the crime from taking place on the first hand rather than curing the damage that has been caused after commission of crime. Predictive policing aims to prevent crime by providing risk assessments, but these risk assessments have risks of their own. One of the concerns that arises is since the risk analyses often lack transparency and explainability, it is not possible to weigh the crime risks to be prevented and the risks of crime prevention properly, which may lead to disproportionate intrusions with the right to privacy and violation of the related rights to equal treatment in equal cases and to protection against discrimination, stereotyping and stigmatization.

2) Bail Proceedings and Predictive Justice

India's bail laws revolve around judicial discretion. The use of judgment and discretion in bail proceedings has drawn a variety of criticisms from a variety of sources. The courts have come under fire for 'gravity' of the offense being given too much weight, according to some. In 2012, the Supreme Court in *Sanjay Chandra vs. CBI*[16], held that an offense's seriousness and gravity should not be the only criteria used to deny an accused person's request for bail. While factors important to conducting an efficient investigation and whether the accused poses a flight risk should be taken into account when deciding whether to grant or deny bail. The Supreme Court recently reiterated the same in *Prabhakar Tewari v. State of U.P. & Ors*[17]. The nature and seriousness of an offense should not be taken into account when conducting a risk assessment during the bail process, according to the 2017 Law Commission Report on Bail in the Code of Criminal Procedure. However, different sessions courts, high courts, and even the Supreme Court frequently disregard this legal standard in bail jurisprudence and regard the nature of an offense as a key consideration in their risk assessment.

Many people have criticized the Courts for placing an excessive emphasis on the "gravity" of the offense. Due to the lack of a statutory foundation for the Supreme Court's opinion noted in the preceding sentence, Abhinav Sekhri has contended that this discretion has grown increasingly unchecked over time. Hence, the absence of uniformity, he says- "*Till the exercise of discretion in bail remains a black-box into which we cannot peer, the only conclusion is that no procedure established by law decides how bail applications are denied or granted.*"[18]

AI-based technologies have the potential to significantly influence bail jurisprudence by merging data that is already available from various parts of the criminal justice system. Empirical data is used to evaluate the "risk" of releasing an accused before trial in the artificial intelligence-based "bail algorithms" that are employed by the American criminal justice system to forecast future outcomes based on historical trends. An AI-powered tool,

[16] Crlminal Appeal N0. 2178 of 2011).
[17] Criminal Appeal No. 153 of 2020).
[18] See, *https://theproofofguilt.blogspot.com/search?q=%22gravity+of+an+offence%22*

called COMPAS or Correctional Offender Management Profiling for Alternative Sanctions has been used to assess recidivism risk and thus, inform parole and sentencing decisions.[19]

The UK has also employed a similar technique called HART (Harm Assessment Risk technique) to identify criminals who are most likely to commit new crimes and to recommend the level of prison monitoring that should be provided. The tool, which uses random forest forecasting (a ML technique), has been developed to aid decision-making by custody officers to predict whether suspects are at low, moderate or high risk of committing further crimes within a two-year period. It does not decide whether the suspect should be kept in custody but is intended to help police officers pick if a person should be referred to a rehabilitation programme called Checkpoint.[20]

To lighten the load on the court, Brazil is using an AI technology named VICTOR to undertake preliminary case analysis. The tool provides document analysis and natural language processing methods to analyze the cases that are brought before the Brazilian Supreme Court. The goal of this tool is to accurately and quickly track resources that deal with issues of 'general repercussions'. This concept of general repercussion is intended to ensure that only questions that are truly relevant to the wider society are heard by the court and exclude appeals that reflect only the unsuccessful party's unwillingness to accept defeat.[21]

While these use cases show the diversity of the application of AI in justice systems, predictive justice experiments have also raised some legitimate concerns around lack of transparency of decision making, curtailing judicial autonomy, impacting sentencing policy of the judges, balancing between law and facts, etc.

4. Improving the Efficiency of Prisons & Correctional Services

Correctional institutions play a key role in reformation of the convicts and re-integration of them back to the mainstream society. But nowadays it has been observed that jails are becoming prime point of criminals and mafias to plan and execute crime. Inmates are having unauthorized access to mobile phones, weapons, cigarettes etc. It's tough for the jail authorities to make a close watch on such activities. However, with the help of AI-based powered surveillance system and using UAV's, activities inside the jail premises can be closely monitored. AI based monitoring is ideal solution to: [22]

- End violence inside jail

[19] Fuso Jovia Bohemaa, "The impact of Artificial Intelligence on Justice Systems" *availableat* https://www.biodiritto.org/ocmultibinary/download/3879/45815/2/f075ebb40b0edec59574dd6d4f9ca2cc/file/paper+25.pdf

[20] *Ibid.*

[21] Daniel Becker and Isabela Ferrari, "VICTOR, The Brazilian Supreme Court's Artificial Intelligence: a beauty or a beast? ", *available at: https://sifocc.org/app/uploads/2020/06/Victor-Beauty-or-the-Beast.pdf* (last visited on 22-09-2022 at 10:41 AM).

[22] Varun VM, "The Role of Artificial Intelligence in Improving The Criminal Justice System in India", *available at: https://thelawbrigade.com/wp-content/uploads/2020/04/Varun-VM-JLSR.pdf* (last visited on 22-09-2022 at 09:51 AM).

- Crowd analysis
- Detection of security threats
- Detection of prison breaches or unauthorized entry.

The UP Government in association with Staqu has launched AI powered video analytic solution with a 'video wall' that covers CCTV footage from all of seventy prisons of Uttar Pradesh.[23]

To accommodate the AI based surveillance system in jails, there arises a need to change the jail manuals.

Review of Literature And Research Gaps

1. **Alisha, *Use of Artificial Intelligence in Criminal Justice System,* (Bluerose Publishers, January 2021).** This book explores various domains of criminal law where the techniques of AI can be used. The book is divided into 5 chapters. Chapter 1 of the book briefly discusses the history of Artificial Intelligence and derives a connection between Artificial Intelligence and Law stating that AI can be used in DNA mapping and analysis, predictive policing, data and legal representation, legal prediction and many more. The chapter mainly focuses on the legal personality of artificial intelligence, presenting various arguments for attributing a separate legal personality to artificial intelligence and has also thrown light on the legal status of artificial intelligence in some countries. Chapter 2 of the book is dedicated to the discussion on the use of Artificial Intelligence in Crime Prediction. The author has put forth examples of several types of crime prediction like predictive policing, co-offending network analysis in practice, suspects investigation, crime location prediction. Chapter 3 is allotted to the discussion on the use of artificial intelligence in criminal forensics. There is a very brief discussion on DNA Analysis. Chapter 4 talks about criminal liability of artificial intelligence, wherein the concept of AIC (Artificial Intelligence Crime) is thoroughly discussed. In the last chapter, the author identifies some grey areas like in case of internet of things, proper "allocation of risks".

Gap: The author has not discussed the approaches to understand Artificial Intelligence which would have helped the readers in better comprehension. The book under the second chapter has not given details about the three prominent predictive analysis tools; COMPAS, HART and VICTOR used respectively in USA, U.K. and Brazil. Under chapter third, the author has not covered all the aspects of Digital Forensics like gunshot detection residue technology. The author does not discuss the various challenges put forth by the use of crime prediction tools. Further the book is a general work on the use of artificial intelligence in criminal

[23] See This Indian startup has launched an AI led 'Video Wall' for Surveillance in India's Prisons, *available at: https://www.businessinsider.in/business/startups/news/staqu-launches-jarvis-an-artificial-intelligence-video-analytics-platform-for-india-prisons/articleshow/71955239.cms#:~:text=Staqu%20launched%20an%20AI%20powered,%2C%20violence%2C%20and%20intrusion%20detection.* (last visited on 22-09-2022 at 09:54 AM).

justice systems and does not specifically cover the issues that are relevant to the Indian system.

2. **Justice Raja Vijayaraghavan , *Introduction of Artificial Intelligence in the Judicial System,*** *available at* https://nja.gov.in/Concluded_Programmes/2021-22/P-1281_PPTs/2.Introduction%20of%20Artificial%20Inteligence%20in%20the%20Judicial%20System.pdf

The author has listed various merits of the use of technology in the administration of justice. He has talked about some basic concepts of AI like Deep Learning, Machine Learning, Big Data, Inter-operable Criminal Justice System (ICJS), N-Step, E-challan, JUDi, SUPAAS, SUVAS, Block chain, etc. The author has also highlighted some of the challenges posed by the use of AI in criminal matters exemplifying it with some of the prominent predictive analysis and recidivism risk analysis tools like COMPAS.

Gap: The author gives a reference to only a few uses of AI in Criminal matters and does not deal with crime prevention and detection.

3. **Reeta Sony, *The Role of Artificial Intelligence in Improving Criminal Justice System: Indian Perspective,*** *available at https://www.researchgate.net/publication/350346087_The_Role_of_Artificial_Intelligence_in_Improving_Criminal_Justice_System_Indian_Perspective*

The research paper discusses a model for detecting the recidivism risk of various states after feeding data based on various parameters.

4. **Christopher Rigano, "Using Artificial Intelligence to Address Criminal Justice Needs,"** ***NIJ Journal 280, January 2019***, *available at* https://www.nij.gov/journals/280/Pages/using-artificial-intelligence-to-address-criminal-justice-needs.aspx.

According to the report, artificial intelligence may eventually become an integral element of our criminal justice system, aiding in investigations and enhancing the ability of criminal justice professionals to uphold public safety. The article basically discusses those research areas under the domain of use of AI in criminal matters which the National Institute of Justice, U.S. Department of Justice currently supports. These fields include DNA analysis, gunshot detection, crime forecasting, and public safety video and image analysis. For instance, to comprehend the potential benefits of AI in terms of speed, researchers at the University of Texas at Dallas, with funding from the NIJ and in collaboration with the FBI and the National Institute of Standards and Technology, are examining techniques for effectively comparing AI algorithms and expert facial examiners.

5. **Tatyana Sushina and Andrew Sobenin, "Artificial Intelligence in the Criminal Justice System: Leading Trends and Possibilities"** ***441 Advances in Social Science, Education and Humanities Research*** **(2019),** *available at: https://www.atlantis-press.com/proceedings/icseal-6-19/125940991.* The authors highlight that on the one hand, a study of the experience of using the artificial intelligence in the criminal proceedings of a

number of foreign states demonstrates that it provides ample opportunities to ensure transparency, predictability, and standardization of the legal system. On the other hand, AI poses many threats with regard to the limited software possibilities that the IT sector can provide. Taking all of these into account, the government officials and legal bodies involved in the law and criminal proceedings should be aware of the opportunities AI might provide and to watch over its effectiveness and development in the real time. The authors have also mentioned that the law enforcement agencies in different countries are increasingly using crime forecasting software including such algorithms as PredPol (Santa Cruz, California, USA), HunchLab (Philadelphia, USA), Precobs (Zurich, Munich), Maprevelation (France) (Kehl and Kessler 2017). Also, the artificial intelligence is used in the work of criminal courts and probation commissions in the USA (Harcourt 2015).

Gap: The work does not amply discuss the challenges put forth by AI in criminal proceedings *vis-à-vis* human rights. Moreover, the research work is discussed in context of Russia and other foreign countries.

6. **Korean Institute of Criminology, "Artificial Intelligence in the Context of Crime and Criminal Justice A Report for the Korean Institute of Criminology" (December, 2018).,** *available at https://www.academia.edu/40999602/Artificial_Intelligence_in_the_Context_of_Crime_and_Criminal_Justice*.The report has dealt with the concept of artificial intelligence and the various approaches to the artificial intelligence. The report exhaustively discusses how AI proves to be a vector of crime. The democratization of AI has given the general public access to crucial resources (data, software, and hardware) needed to use and create their own AI tools, which could potentially provide malevolent actors more power to utilize AI for wrongdoing. The report examines how law enforcement agencies around the world have begun using AI-powered technologies to detect, investigate, prevent and at times even try to predict crimes. There is a long history of the use of technology in criminal investigations, but the use of AI has the power to facilitate unprecedented levels of surveillance and social control. AI can for example, learn to identify the location where an image or a video has been shot, or to associate particular tattoos with specific gang affiliations or meanings. Face recognition technology and its live-tracking capacity also relies heavily on AI, with China making extensive use of it in its urban centres. Other crime detection use cases include body-worn cameras, speech recognition technology (for phone intercepts for example), gunshot detection systems, and DNA and digital forensic analysis at scale. AI is also being leveraged by law enforcement to try to prevent and predict crime, with products such as PredPol claiming to be able to pinpoint the location of future occurrences, thereby enabling the dispatch of a proactive and deterrent police presence.

7. Parliamentary Assembly, Committee on Legal Affairs and Human Rights, "Justice by algorithm- the role of artificial intelligence in policing and criminal justice systems" *available at: https://pace.coe.int/en/files/28723*. This is a draft resolution and draft recommendation unanimously adopted by the committee on 9 september, 2020. The resolution mentions that a large number of applications of AI for use by the police and criminal justice systems have been developed around the world. Some of these have been

used or their introduction is being considered in Council of Europe member States. They include facial recognition, predictive policing, the identification of potential victims of crime, risk assessment in decision-making on remand, sentencing and parole, and identification of 'cold cases' that could now be solved using modern forensic technology. The Assembly finds that there are many ways in which the use of AI in policing and criminal justice systems may not be in consistence with the core ethical principles. Of particular concern are, for instance, AI systems may be provided by private companies, which may rely on their intellectual property rights to deny access to the source code; AI systems are trained on massive datasets, which may be tainted by historical bias, including through indirect correlation between certain predictor variables and discriminatory practices (such as postcode being a proxy identifier for an ethnic community historically subject to discriminatory treatment). This is a particular concern in relation to policing and criminal justice, because of both the prevalence of discrimination on various grounds in this context and the significance of decisions that may be taken. The apparent mechanical objectivity of AI may obscure this bias ("techwashing"), reinforce and even perpetuate it. Certain AI techniques may not be readily amenable to challenge by subjects of their application. Such considerations raise issues of justice and fairness; Resource constraints, time pressure, lack of understanding, and deference to or reluctance to deviate from the recommendations of an AI system may lead police officers and judges to become overly reliant on such systems, in effect abdicating their professional responsibilities. Such considerations raise issues of responsibility for decision-making.

8. **Nipuni Wickramarathna and E.A.T.A Edirisuriya, " Artificial Intelligence in the Criminal Justice System: A Literature Review and A Survey"** *available at: https://www.researchgate.net/publication/358635259_Artificial_Intelligence_in_the_Criminal_Justice_System_A_Literature_Review_and_a_Survey_N_A_Wickramarathna_1_and_EATA_Edirisuriya*

The researchers have conducted an empirical study using questionnaire as to know if people in Sri Lanka are aware of Artificial Intelligence and attempted to know their opinion on the inclusion of artificial intelligence in the Sri Lankan Criminal Justice System.

9. **European Commission For The Efficiency of Justice (ECPEJ), "European Ethical Charter on The use of Artificial Intelligence in Judicial Systems And Their Environment" (December 2018),** *available at: https://rm.coe.int/ethical-charter-en-for-publication-4-december-2018/16808f699c*

The charter discusses the five principles on the use of artificial intelligence in Judicial Systems and Their Environment. The five principles are i) principle of respect for fundamental rights, ii) principle of non-discrimination iii) principle of quality and security iv) principle of transparency, impartiality and fairness and v) principle of "under user control".

10. Fuso Jovia Bohemaa, "The impact of Artificial Intelligence on Justice Systems" *availableat* https://www.biodiritto.org/ocmultibinary/download/3879/45815/2/f075ebb40b0edec59574dd

6d4f9ca2cc/file/paper+25.pdf The author brings to the light two approaches *vis-a-vis* use of AI in criminal justice. One, where the AI will function as a 'black box' that turns the fact of the case (input) into a legal consequence (output) and will autonomously decide the solution of the case. On the contrary, AI to be used as an assistive tool in legal proceedings. The author has mentioned the use cases of both the scenarios and has opinionated that the involvement of AI in criminal justice must be limited and adopted as an assistive tool to the work of a judge and not as a replacement.

11. Tania Sourdin, ""Justice in the age of technology: 'The rise of machines is upon us'" *available at http://classic.austlii.edu.au/au/journals/PrecedentAULA/2017/16.html*

The author has talked about the three levels in which technology is reshaping the judicial system. The supportive technology; the replacement technology and the third level, the disruptive technology. Due to this initial level of supportive innovation, a lot of individuals may now find justice services online and learn about the options and alternatives (including legal alternatives) to the judicial system through web-based information systems. People also increasingly locate and obtain legal support and services online, and the growth in online legal firms who may provide 'unbundled' legal services has been significant over the past few years. The last decade has seen a significant growth in replacement technologies. These technologies can replace certain interactive parts of justice processes. As with supportive technologies, replacement technologies can have an impact on how complex disputes are managed and resolved. For instance, there are numerous sophisticated technologies available that may arrange papers and files in disputes to make things simpler and cut down on the amount of time needed to review and analyze materials. These replacement procedures are frequently referred to as online dispute resolution (ODR) in the context of ADR. The third level of technological change consists of technologies that may significantly change ADR and judicial processes. Newer technologies may enable options for resolution to be developed via technology and use AI to develop alternatives and run processes. In this regard, some disruptive technologies are linked to AI which can be viewed as a form of dispute resolution or a system that has the capacity to render expertadvice or decision-making.

12. Fair Trials, "Regulating Artificial intelligence for Use in the Criminal Justice Systems in the EU – A Policy Paper",

available at: https://www.fairtrials.org/app/uploads/2022/01/Regulating-Artificial-Intelligence-for-Use-in-Criminal-Justice-Systems-Fair-Trials.pdf

The policy paper has urged that in order to regulate the use of AI in criminal justice proceedings, the EU, must at a minimum, set standards to answer questions like 1)what standards are needed to govern the design and deployment of AI systems in criminal justice systems; 2) what safeguards are needed in criminal justice proceedings to make sure that AI systems are used in accordance with human rights standards and prevent discrimination; and **3)** how Member States should govern the deployment of AI systems and monitor their subsequent use. The paper has mentioned some procedural safeguards, to tackle automation-bias amongst criminal justice decision makers, like a) making it a legal requirement for

decision-makers to be adequately alerted and informed about the risks associated with AI systems; b) making AI systems' assessments intelligible to decision-makers; c) requiring decision-makers to provide full, individualised reasoning for all decisions influenced by an AI system; and d) making it easy for decision-makers to overrule AI assessments that produce unfavorable outcomes for defendants. It vehemently emphasizes that Member States should have laws that govern how AI systems are relied upon in criminal proceedings, and there must be adequate safeguards to prevent over-reliance on AI by decision-makers, to prevent discrimination and to ensure scrutiny and effective challenge by the defence.

13. Vidhi Centre for Legal Policy and TCG Crest , "Responsible Artificial Intelligence for the Indian Justice System" (April, 2021). The strategy paper is in close nexus with this research paper, however, the paper has not particularly and comprehensively dealt with the use of AI in the criminal justice system. The strategy paper is divided into four sections. Section 1 deals with introducing potential use cases for AI in the Indian Justice System. The second section gives numerous use cases that have emerged in other jurisdictions, showing the versatility of such emerging technologies. The third section deals with the short-term and long-term challenges posed by the integration of AI within justice system. The fourth section deals with the roadmap for the short-term steps that need to be effectuated and the long-term strategy that must be put in place, to facilitate this transformation.

14. Vincent Huynh- Watkins, "Abstracting Injustice: An analysis of the use of artificial intelligence in Criminal Justice" 2021 (Departmental Honours Thesis).,
available at: https://www.cs.uoregon.edu/Reports/UG-202106-Huynh-Watkins.pdf
The research work has been written in the context of the criminal justice system of the United States of America. The author has *inter alia* touched upon the use of AI-based COMPAS for recidivism risk assessment; facial recognition which may help investigators and prosecutors solve previously unsolvable cases and predictive policing algorithms which may also help law enforcement agencies predict criminal activities prior to its occurrence. In relation to COMPAS, he mentions the case of Wisconsin v. Loomis (2016) wherein it was used to prepare 'Presentencing Investigation Report', which PSI affects the severity of a sentence. The author writes that artificial intelligence and machine learning algorithms are trained on some sort of historical data – although this data might be made publicly available, models will often be trained on extremely large data sets, making vetting of this data time consuming and laborious. Additionally, the nature of some machine learning models can create a situation in which the developers don't understand how a given model comes to its conclusion.

15. Varun VM, "The Role of Artificial Intelligence in Improving The Criminal Justice System in India", *available at:* *https://thelawbrigade.com/wp-content/uploads/2020/04/Varun-VM-JLSR.pdf* The author has highlighted some of the ways in which Artificial Intelligence can be used in improving the criminal justice system. For instance, 1) use of AI in improving the efficiency of criminal courts, for example, its use in legal research as the AI-based database can make the task easier *vis a vis* helping the lower courts to locate decisions of higher courts; AI-based tools can be used by the complainant,

police, to identify court having jurisdiction over the matter; AI in document review; AI powered systems to issue processes; Record of court proceedings. 2) use of AI in assisting prosecution wing to conduct cases. AI- based technology can identify serious frauds, money laundering, employee theft, insider trading, fake invoices etc. 3) Role of AI in improving the efficiency of prisons and correctional services.

Statement of The Problem

'Artificial Intelligence' ('AI'), comprising machine-learning and other analytical algorithm-based automated systems, has become an important aspect of our lives. This technology has been used in criminal justice systems all around the world in recent years, and it has become more and more important to how justice is administered in criminal cases. Perceptions about the dependability and objectivity of technology solutions, as well as demands for cost reductions in policing and judicial services, are frequently the driving forces behind this trend. While the AI in the Indian Judiciary might still be in its nascent stage of development, across the globe AI has found a lot of inroads within justice systems. For instance, crime prediction and recidivism risk assessment tools like COMPAS (assessing recidivism risk, informing decisions); HART (forecasting reoffending criminals); VICTOR (tracking resources related to 'general repercussions,) have been introduced in U.S.A, U.K and Brazil respectively. These tools though have proved to be highly beneficial, nevertheless have invoked controversies. Linkedto this, risk assessment tools in the United States of America have been critiqued as unfair due to the disproportionate targeting to minority individual and communities by the police. In fact, such tools have miscalculated the risk of recidivism for individual from minority versus majority communities.

Related to this, in December 2018, the European Commission for the Efficiency of Justice settled out the first ethical principles, associated to the use of Artificial Intelligence in a Charter, which provides basic principles that can guide judicial professionals when they confront with the rapid development of Artificial intelligence in the national judicial process. Particularly, the Commission has identified five principles that must be respected in the field of Artificial Intelligence and justice: i) principle of respect of fundamental rights- make sure that the ECHR and the Convention on the Protection of Personal Data (Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data, ETS No. 108 as amended by the CETS amending protocol No. 223) fundamental rights are compatible with the design and implementation of artificial intelligence tools and services. ii) principle of non –discrimination; which implies that AI must not be used as an excuse to discriminate marginalized individuals or minority groups; iii) principle of quality and security; Use verified sources and intangible data with models created in a multidisciplinary manner, in a secure technology environment, while processing court judgments and data; iv) principles of transparency, impartiality and fairness; which means that the Data processing methods must be accessible and understandable to individuals. A balance must be struck between the intellectual property of some processing methods and the necessity for transparency (access to the design process), impartiality (absence of bias), fairness, and intellectual integrity (prioritizing the interests of justice) when tools are used that could have legal repercussions or could significantly affect people's lives. v) the principle of 'under user control' which implies that user must have a clear information about the data processing in order to make their choices. Justice system professionals should always be

allowed to assess court rulings and the data that led to a conclusion and not necessarily be bound by them given the unique circumstances of each case.

The research finds that there are many ways in which the employment of AI in policing and criminal justice systems goes against he previously mentioned core principles. For instance, AI systems may be provided by private companies, which may rely on their intellectual property rights to deny access to the source code; AI systems are trained on massive datasets, which may be tainted by historical bias; resource constraints, time pressure, lack of understanding, and deference to or reluctance to deviate from the recommendations of an AI system may lead officers and judges to become overly reliant on such systems. Thus, the study is focused on analyzing various legal issues that may arise due to the introduction of Artificial Intelligence in Criminal Justice System in India.

OBJECTIVES OF THE STUDY

The present study is taken with the following objectives:

1) To ascertain the efficacy and inevitability of the AI in the criminal justice system in the present world of science and technology.
2) To evaluate the numerous use cases that have emerged in other jurisdictions, showcasing the versatility of such emerging technologies.
3) To analyze the different legal issues which will arise due to the application of AI in India.
4) To ascertain the possible legal measures to address various legal issues that may arise due to the use of AI in India.

RESEARCH QUESTIONS

1. What is meant by 'AI' and how might it help the criminal justice system?
2. Whether and in what way can legal personality be conferred on AI?
3. How can Crime Forensics be benefitted from the use of Artificial Intelligence?
4. Does AI-driven evidence warrant changes in extant criminal justice system?
5. How can AI-led tools be employed to prevent and predict crimes?
6. What can be the different legal challenges put forth by the use of AI tools for predictive policing and predictive justice?
7. In what ways can AI powered surveillance systems be employed to improve jail and correctional services?
8. Does inclusion of AI in jails necessitate changes in jail manuals?
9. What should be the regulatory approach to address various legal issues that can arise by the use of AI in criminal justice system?

Research Methodology

The research work is intended to be doctrinal. For the purposes of collecting the secondary data for doctrinal study, reliance would be placed on various sources viz. relevant Law Reviews, Legislations, policies, text-books, articles, journals, e-journals, web references, newspapers, Reports of Law Committees and Commissions, international instruments and the various judgments by judiciary that have been delivered so far and the statistical data provided by various bodies.

Tentative Chapter Plan

The present research work is divided mainly into five chapters including introduction and a conclusion.

Chapter 1: Introduction and Methodology

This chapter is introductory in nature, highlighting the problem against which the study has been undertaken, the research questions, the objectives with which the study is carried out, the design of the study and the research methodology employed.

Chapter 2: Defining Artificial Intelligence: What is Artificial Intelligence and its Importance *vis-a-vis* The Criminal Justice System?

The chapter seeks to explain the history and features of AI. It will also deal with the issues of legal personality as well as criminal liability of Artificial Intelligence and how can Artificial Intelligence be the vector of crime. Besides, the chapter will also give an overview encompassing the role of Artificial Intelligence in improving Criminal Justice System.

Chapter 3: Artificial Intelligence for Crime Prediction and Prevention

This chapter will focus on how law enforcement agencies in some specific countries have begun using AI powered tools in predictive policing and predictive justice and the various legal and ethical concerns that have evolved by the use of AI in crime prediction and prevention in those countries.

Chapter 3: Artificial Intelligence for Crime Detection: Uses and Implications

This chapter will be devoted to analyse how AI powered tools and technology can be implemented in investigatory processes and collection of evidence. Moreover, it will examine the various challenges that have come to the forefront.

Chapter 5: Conclusion and Suggestions

At the end, the conclusions of the study, implications of the study results and suggestions for improvement shall be discussed.

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